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Appendix to "Evaluating the Benefits of Tax-Efficient Retirement Withdrawal Planning Using a Linear Programming Model"

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Appendix: A Marginal Analysis

When should one withdraw from tax-deferred savings before taxable savings to realize higher growth in total account balance over one year? Note that this is the reverse of the commonly recommended rule (CR).

Assume you have a total of $S(t)$ dollars in taxable and tax-deferred retirement savings at the end of year t . You withdraw enough from your taxable savings at the beginning of year $(t + 1)$ to cover your living expenses and taxes (above any allowances for RMDs, Social Security, and other income sources) and are left with $S(t + 1)$ at the end of year $(t + 1)$. Suppose you decide you need \$1 more at the beginning of year $(t + 1)$. Let's consider the reduction in $S(t + 1)$ under the two cases:

- A Take the \$1 from taxable savings
- B Take the \$1 from tax-deferred savings + the amount needed to pay federal taxes on the \$1

Let r_x = marginal tax rate
 r_t = taxable savings rate of return (ROR)
 r_d = tax-deferred savings ROR

- A) Marginal reduction in $S(t + 1)$ if \$1 from taxable savings:

$$\begin{aligned} S(t + 1) \text{ reduction} &= \$1 \text{ plus net-tax interest that would have been made on the } \$1 \\ &= \$1 + \$1 * r_t * (1 - r_x) = 1 + r_t * (1 - r_x) \end{aligned}$$

- B) Marginal reduction in $S(t + 1)$ if \$1 from tax-deferred savings:

$$\begin{aligned} S(t + 1) \text{ reduction} &= \$1 \text{ (adjusted for taxes to realize a net } \$1) \text{ plus interest that would have} \\ &\text{been made on the adjusted } \$1 \\ &= \$1/(1 - r_x) + \$1/(1 - r_x) * r_d = (1 + r_d)/(1 - r_x) \end{aligned}$$

It would be preferable to draw from tax-deferred rather than from taxable savings if the marginal reduction from A is greater than the marginal reduction from B. That is, if

$$1 + r_t * (1 - r_x) > (1 + r_d)/(1 - r_x)$$

Or (after a little algebra)

$$r_t > (r_d + r_x)/(1 - r_x)^2$$

In plain English, this says draw down tax-deferred savings first if taxable savings ROR is greater than the sum of tax-deferred ROR plus the marginal tax rate. Is this likely to occur? Not if one is paying taxes! For example, even if r_d is only 1 percent and one's marginal tax rate is 10 percent, r_t would have to be greater than 13.6 percent.

However, if the marginal tax rate, r_x , is zero (say, when deductions exceed income), then r_t could be greater than (a tax-equivalent) r_d , especially when, for example, a large proportion of income from taxable savings is from capital gains, municipal bonds, or Roth IRAs.